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2009 OTTER AND BEAVER HARVEST SURVEY

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ABSTRACT

A survey was completed to determine the number of otter harvest tag holders that set traps for otter and beaver, the number of animals caught, the types of traps used, and the number of days they trapped. In 2009, 2,561 furtakers obtained a harvest tag to take otter, which was 7% less than in 2008*. About 29% of the tag holders set traps for otter (739 trappers) and 48% set traps for beaver (1,218). Trappers that targeted otter spent nearly 15,521 days trapping otter ($\bar{x}$ = 21 days/trapper), captured 810 otter (included animals released alive), and registered 754 otter. An additional 317 otter were registered by trappers that were not targeting otter. The total number of otter registered by all trappers combined increased significantly by 34% between 2008 and 2009. About 63% of trappers targeting otter captured at least one otter. The number of trappers that attempted to catch otter and their trapping effort (days afield) were not significantly different between 2008 and 2009. The mean number of days of effort per registered otter in 2009 decreased significantly by 20% from 2008. Beaver trappers spent nearly 31,455 days trapping beaver ($\bar{x}$ = 26 days/trapper) and captured 15,273 beaver. About 90% of active beaver trappers captured at least one beaver. The number of trappers that attempted to catch beaver, their days spent trapping, and their harvest of beaver were not significantly different between 2008 and 2009.*

INTRODUCTION

The Michigan Natural Resources Commission and the Department of Natural Resources (DNR) have the authority and responsibility to protect and manage the wildlife resources of the state of Michigan. Harvest surveys are a management tool used to help accomplish this statutory responsibility. The main objectives of this harvest survey were to determine the number of trappers who set traps for otter (*Lontra canadensis*), the types of traps used, the number of days they trapped, and the number of animals captured. Because otter trappers

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frequently seek to catch beaver (*Castor canadensis*), they also were asked whether they attempted to trap beaver. If they trapped beaver, they were asked to report the number of days they trapped and the number of beaver caught.

While the primary objectives of this survey were estimating harvest, trapper numbers, and trapping effort, this survey also provided an opportunity to collect information about management issues. Questions were added to the questionnaire to determine how often trappers set snares in open water for beaver and how often trappers attempted to capture beaver during April.

In 2009, the state was divided into three management zones (Figure 1), and the otter and beaver trapping seasons were different for each zone (Table 1). Seasons also differed for residents and nonresidents of Michigan. In order to trap otter, trappers were required to obtain a free otter harvest tag in addition to a fur harvesters license (included Fur Harvester, Junior Fur Harvester, Senior Fur Harvester, Non-resident Fur Harvester, Military Fur Harvester, Resident Fur [trap only], and Junior Fur [trap only]). Beaver trappers also were required to purchase a fur harvesters license but did not need a harvest tag. Trappers were limited to three otter, except no more than one otter could be taken in Zone 2 and one otter from Zone 3. No maximum limit was set for the number of beaver that could be harvested. Successful trappers were required to register all otter taken by May 5, 2010, but trappers were not required to register beaver. Trappers were not allowed to keep incidentally caught otter. However, trappers were required to bring these incidentally caught otter to a registration station if they could not be released alive. Trappers could use body-gripping (conibear type) traps and foothold traps to capture otter and beaver. In addition, trappers could use snares to capture beaver from December 1 through March 31. Snares could be set in the water or under ice. Snares had to be made of 1/16-inch or larger cable. If a snare was not set under ice, at least of the snare had to be under water, and it had to be set so it would hold a captured beaver completely under the water.

METHODS

A questionnaire (Appendix A) was sent to everyone who obtained an otter harvest tag in 2009 (2,561 harvest tag holders). Trappers receiving the questionnaire were asked to report if they trapped otter or beaver, number of days spent afield, number of otter and beaver caught, number of otter released alive, and number of otter registered (registration estimates included incidentally caught animals that were not returned to the trapper). Trappers were also asked to indicate their impression of the status of the otter and beaver populations in the county where they primarily trapped (i.e., absent, stable, increasing, or decreasing).

Questionnaires were mailed initially during late June 2010, and nonrespondents were mailed up to two follow-up questionnaires. Although 2,561 people were sent the questionnaire, 40 surveys were undeliverable, resulting in an adjusted sample size of 2,521. Questionnaires were returned by 1,566 people, yielding a 62% adjusted response rate.

Although all harvest tag holders were sent a questionnaire, not all questionnaires were returned. To extrapolate from the tag holders that returned their questionnaire to all people obtaining harvest tags, estimates were calculated using a simple random sampling design (Cochran 1977) and were presented along with their 95% confidence limit (CL). This CL can

be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval is a measure of the precision associated with the estimate and implies the true value would be within this interval 95 times out of 100. Estimates were not adjusted for possible response or nonresponse bias. The 2009 estimate of otter registered included incidental animals that trappers were not allowed to keep (i.e., harvest exceeding the bag limit); however, it did not include animals taken by trappers as part of a nuisance control business.

Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. Rather, these estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.

Statistical tests are used routinely to determine the likelihood the differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals was equivalent to stating the difference between the means was larger than would be expected 995 out of 1,000 times ($P < 0.005$), if the study had been repeated (Payton et al. 2003).

RESULTS AND DISCUSSION

Otter

In 2009, 2,561 trappers obtained harvest tags to trap otter, which was 7% less than the 2,748 trappers with tags in 2008. In 2009, most of the harvest tags (2,470) were obtained by men. Harvest tags were obtained by 89 women, and the sex of 2 tag holders was unknown. About 29% of the otter tag holders set traps targeting otter (739 trappers, Table 2). These trappers spent 15,521 days trapping otter ($\bar{x}$ = 21.0 ± 1.4 days/trapper), captured 810 otter, and registered 754 otter (Table 3). About 63% of trappers successfully captured at least one otter.

The estimated number of otter registered by trappers that targeted otter increased significantly by 33% between 2008 and 2009 (566 versus 754 otter, Table 3). An additional 317 otter were registered by trappers that were not targeting otter. The estimated total number of otter registered by all trappers combined increased significantly by 34% between 2008 and 2009 (763 versus 1,022 otter, Table 3). The management zone with the greatest number of otter captured by all trappers combined was the Upper Peninsula Management Zone (602 otter, Table 4), and among counties, Ontonagon (65), Gogebic (64), Iron (59), Marquette (59), and Chippewa (54) counties had the highest harvest estimates (Table 5).

The number of otter registered (including incidental take) by trappers at registration stations increased 45% between 2008 and 2009 (709 versus 1,030 otter, Figure 2). The number of trappers that attempted to catch otter and their effort did not change significantly between 2008 and 2009 (Table 3, Figure 2). Among trappers targeting otter, the mean number of days of effort per registered otter was 20.6 days in 2009, which was significantly less (-20%) than the 25.6 days in 2008 (Tables 3 and 6, Figure 3).

The number of otter registered in 2009 was 18% above the long-term yearly average since 1950 ($\bar{x}$ = 870 during 1950-2009, Figure 4). Changes in otter harvest during recent years

have tracked changes in trapping effort (Figure 2) and changes in otter pelt prices (Figures 5 and 6). Although otter harvest has declined in recent years, estimates of effort per catch for otters have not changed significantly; suggesting otter numbers were stable statewide (Figure 3).

The number of otter registered was correlated with the mean value of otter pelts during 1989-2009 (Pearson product moment correlation coefficient [r] = 0.82, probability of obtaining this result [P] < 0.01) (Figure 6). The correlation between mean days of effort per registered otter and pelt prices during 1997-2009 ($r = 0.79$, $P < 0.01$) was also significant.

Most otter trappers used conibear-type traps to capture otter (92 ± 2%), although foothold traps also were used frequently (36 ± 3%). Among trappers using conibear traps, the mean number of conibear traps set was 4.9 ± 0.3 traps. Among trappers using foothold traps, the mean number of foothold traps set was 4.2 ± 0.4 traps.

Thirty-three percent of otter trappers (±3%) believed otter numbers were increasing in the county where they trapped most often, while 57 ± 3% thought otter numbers were stable, 6 ± 1% thought otter were declining, 1 ± 1% indicated otter were not present, and 3 ± 1% did not comment on the status of otter.

Beaver

Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping did not include all furtaker participation, effort, or harvest. Rather, these estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag. Furthermore, trappers taking beaver as part of a nuisance control business were asked to exclude nuisance animals from their reported harvest on annual harvest surveys beginning in 2003. Thus, estimates associated with beaver may not be directly comparable among years.

About 48% of the otter harvest tag holders set traps for beaver (1,218 trappers, Table 2). Trappers spent 31,455 days trapping (25.8 ± 1.4 days/trapper) and captured 15,273 beaver (Table 7). About 90 ± 1% of active trappers successfully captured at least one beaver. The greatest number of beaver were captured in the Upper Peninsula Management Zone (7,987 beaver, Table 8), and among counties, Chippewa (1,163), Ontonagon (962), Marquette (896), and Schoolcraft (605) counties had the highest harvest estimates (Table 9).

The estimated number of beaver caught was similar between 2008 and 2009 (15,273 versus 15,270 beaver, Table 7). The number of trappers that attempted to catch beaver and the number of days spent trapping effort also were similar between 2008 and 2009 (Table 7, Figure 7).

Most beaver trappers used conibear-type traps to capture beaver (93 ± 1%), although 62 ± 2% of trappers used foothold traps and 11 ± 1% used snares. Among trappers using conibear traps, the mean number of conibear traps set was 9.1 ± 0.5 traps. Among trappers using foothold traps, the mean number of foothold traps set was 9.7 ± 2.7 traps, and among trappers using snares, the mean number of snares set was 10.1 ± 3.8.

Twenty-four percent of beaver trappers (±2%) believed beaver numbers were increasing in the county where they trapped most often, while 53 ± 2% thought beaver numbers were stable, 20 ± 2% thought they were declining, and about 4% of trappers either indicated beaver were absent in the area they trapped or did not comment on the status of beaver.

An estimated 69 trappers caught 128 beaver with snares in open water during the 2009 season (Table 7). About 527 trappers caught 5,253 beaver during April 2009. Beaver harvested with snares in open water and taken during April represented about 1% and 34% of the estimated total beaver harvest, respectively. Among trappers that set traps for beaver, 18 ± 2% caught otter in their beaver sets. These trappers caught 353 ± 55 otter.

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Table 1. Otter and beaver trapping seasons in Michigan, 2009.

	Season	
Zone	Resident	Nonresident
1	October 25 – April 18[a]	November 15 – April 18
2	November 1 – April 18	November 24 – April 18
3	November 10 – March 31	December 15 – March 31

[a]The season extended through April 30 in Zone 1 on designated trout streams for residents.

Table 2. Estimated number of otter harvest tag holders that attempted to trap otter or beaver in Michigan during 2009 season.

Harvest tag holders	%	95% CL[a]	Total	95% CL[a]
Trapped only otter	6	1	154	19
Trapped only beaver	25	1	633	34
Trapped both otter and beaver	23	1	585	33
Trapped either otter or beaver	54	2	1,372	39
Trapped otter[b]	29	1	739	36
Trapped beaver[c]	48	2	1,218	39

[a]95% confidence limits.
[b]Sum of trappers that trapped only otter and trappers that trapped both otter and beaver.
[c]Sum of trappers that trapped only beaver and trappers that trapped both otter and beaver.

Table 3. Estimated number of otter trappers, their trapping effort (days), number of otter captured, mean days required to harvest an otter, and trapping success in Michigan during 2007-2009. Estimates presented separately for trappers targeting otter and for trappers that were not targeting otter.

	Year						
	2007		2008		2009		Change[a]
Variable	Estimate	95% CL	Estimate	95% CL	Estimate	95% CL	(%)
Among trappers targeting otter							
Trappers (No)	731	33	680	35	739	36	9
Effort (Days)	15,802	1,254	14,439	1,258	15,521	1,264	7
Otters captured (No.)	648	67	617	52	810	63	31*
Otters released alive (No.)	94	43	51	18	56	17	8
Otters registered (No.)	555	46	566	47	754	57	33*
Trappers that captured an otter (%)	50	3	57	3	63	3	6*
Trappers that released an otter (%)	6	1	4	1	5	1	1
Trappers that registered an otter (%)	48	3	56	3	63	3	7*
Mean days required to harvest an otter	28.7	2.4	25.6	2.4	20.6	1.7	-20*
Among trappers that did not target otter							
Trappers (No)	102	14	129	17	195	21	51*
Otters captured (No.)	146	24	198	31	317	54	61*
Otters registered (No.)	146	24	198	31	268	36	36*
Among all trappers							
Trappers (No)	833	35	808	36	919	38	14*
Otters captured (No.)	794	70	815	59	1,127	81	38*
Otters registered (No.)	700	51	763	54	1,022	65	34*
Mean days required to harvest an otter	22.8	1.9	18.9	1.7	15.2	1.3	-20*

[a]The change between 2008 and 2009 for proportion of trappers catching otters and registering otters is reported as the difference between years rather than the proportional change.

*P<0.005.

Table 4. Estimated number of trappers, trapping effort, otter captured, otter released alive, otter registered, and success among otter trappers during the 2009 Michigan trapping season, summarized by area.

	Trappers		Trapping effort (days)		Otter captured[a]		Otter released alive		Otter registered[b]		Trapper success	
Area	Total	95% CL[c]	Total	95% CL[c]	Total	95% CL[c]	Total	95% CL[c]	Total	95% CL[c]	%	95% CL[c]
Among trappers targeting otter												
Upper Peninsula	348	27	6,646	782	505	57	34	15	471	51	67	4
Lower Peninsula	404	29	8,774	1,041	291	30	21	8	270	27	59	4
Zone 2	280	25	5,256	734	182	22	13	6	168	20	58	5
Zone 3	155	19	3,518	671	110	19	8	4	101	17	58	6
Unknown	8	4	101	70	13	8	0	0	13	8	100	0
Statewide	739	36	15,521	1,264	810	63	56	17	754	57	63	3
Among trappers that did not target otter												
Upper Peninsula	67	13	NA	NA	165	50	34	34	131	30	NA	NA
Lower Peninsula	129	17	NA	NA	147	21	15	7	132	19	NA	NA
Zone 2	87	14	NA	NA	92	15	7	4	85	14	NA	NA
Zone 3	44	10	NA	NA	56	14	8	6	47	12	NA	NA
Unknown	2	2	NA	NA	5	6	0	0	5	6	NA	NA
Statewide	195	21	NA	NA	317	54	49	35	268	36	NA	NA
Among all trappers combined												
Upper Peninsula	410	29	6,646	782	671	75	69	37	602	59	68	4
Lower Peninsula	527	32	8,774	1,041	438	36	36	11	402	32	68	3
Zone 2	363	28	5,256	734	273	27	20	7	253	25	67	4
Zone 3	196	21	3,518	671	165	24	16	7	149	21	66	5
Unknown	10	5	101	70	18	10	0	0	18	10	100	0
Statewide	919	38	15,521	1,264	1,127	81	105	39	1,022	65	68	2

[a]All otter removed from traps, including all incidental catches and releases.
[b]Included incidentally caught otter that were not returned to the trapper.
[c]95% confidence limits.

Table 5. Estimated number of trappers, trapping effort, otter captured (including all incidental catches and releases), otter released alive, and otter registered (including incidental catches) among otter trappers during the 2009 Michigan trapping season, summarized by county.[a]

	Trappers		Trapping effort (days)		Otter captured[b]		Otter released alive		Otter registered[c]	
County	Total	95% CL[d]	Total	95% CL[d]	Total	95% CL[d]	Total	95% CL[d]	Total	95% CL[d]
Alcona	25	8	321	134	13	6	0	0	13	6
Alger	26	8	571	326	49	23	20	14	29	12
Allegan	8	4	82	64	3	3	0	0	3	3
Alpena	20	7	293	146	8	4	0	0	8	4
Antrim	10	5	136	94	7	4	0	0	7	4
Arenac	3	3	8	10	2	2	0	0	2	2
Baraga	26	8	303	149	34	15	2	2	33	14
Barry	11	5	119	72	3	3	0	0	3	3
Bay	7	4	108	85	5	3	0	0	5	3
Benzie	5	3	13	12	5	3	0	0	5	3
Berrien	0	0	0	0	0	0	0	0	0	0
Branch	0	0	0	0	0	0	0	0	0	0
Calhoun	2	2	0	0	2	2	0	0	2	2
Cass	2	2	34	42	0	0	0	0	0	0
Charlevoix	2	2	0	0	0	0	0	0	0	0
Cheboygan	28	8	185	82	23	8	2	2	21	7
Chippewa	47	11	728	302	59	21	5	6	54	18
Clare	34	9	432	191	29	9	3	3	26	8
Clinton	5	3	57	45	3	3	0	0	3	3
Crawford	15	6	329	166	7	4	0	0	7	4
Delta	26	8	260	114	33	13	0	0	33	13
Dickinson	26	8	581	217	41	18	5	6	36	15
Eaton	3	3	34	30	2	2	0	0	2	2
Emmet	7	4	106	86	5	3	0	0	5	3
Genesee	3	3	47	41	0	0	0	0	0	0
Gladwin	15	6	311	179	8	4	0	0	8	4
Gogebic	36	9	417	129	64	20	0	0	64	20
Gd. Traverse	11	5	415	211	5	3	0	0	5	3
Gratiot	7	4	116	121	2	2	0	0	2	2

[a]Included activity of trappers targeting otter and trappers not targeting otter combined.
[b]All otter removed from traps, including all incidental catches and releases.
[c]Included incidentally caught otter that were not returned to the trapper.
[d]95% confidence limits.

Table 5 (continued). Estimated number of trappers, trapping effort, otter captured (including all incidental catches and releases), otter released alive, and otter registered (including incidental catches) among otter trappers during the 2009 Michigan trapping season, summarized by county.[a]

	Trappers		Trapping effort (days)		Otter captured[b]		Otter released alive		Otter registered[c]	
County	Total	95% CL[d]	Total	95% CL[d]	Total	95% CL[d]	Total	95% CL[d]	Total	95% CL[d]
Hillsdale	0	0	0	0	0	0	0	0	0	0
Houghton	23	7	507	278	29	13	0	0	29	13
Huron	2	2	5	6	0	0	0	0	0	0
Ingham	2	2	0	0	0	0	0	0	0	0
Ionia	8	4	196	147	8	5	2	2	7	4
Iosco	7	4	39	34	5	3	0	0	5	3
Iron	41	10	572	172	59	21	0	0	59	21
Isabella	16	6	330	170	11	6	2	2	10	5
Jackson	2	2	39	48	0	0	0	0	0	0
Kalamazoo	0	0	0	0	0	0	0	0	0	0
Kalkaska	26	8	357	171	15	7	0	0	15	7
Kent	15	6	240	189	8	5	2	2	7	4
Keweenaw	8	4	154	97	5	3	0	0	5	3
Lake[d]	15	6	177	105	7	4	0	0	7	4
Lapeer	2	2	25	30	0	0	0	0	0	0
Leelanau	2	2	5	6	2	2	0	0	2	2
Lenawee	0	0	0	0	0	0	0	0	0	0
Livingston	5	3	131	98	0	0	0	0	0	0
Luce	26	8	167	84	28	17	10	12	18	9
Mackinac	44	10	352	115	46	15	0	0	46	15
Macomb	0	0	0	0	0	0	0	0	0	0
Manistee	11	5	100	59	10	5	0	0	10	5
Marquette	41	10	569	209	59	18	0	0	59	18
Mason	11	5	72	46	10	6	3	3	7	5
Mecosta	25	8	201	111	28	11	7	5	21	8
Menominee	29	8	608	237	47	16	7	5	41	14
Midland	15	6	368	211	16	7	0	0	16	7
Missaukee	13	6	51	34	8	4	0	0	8	4
Monroe	0	0	0	0	0	0	0	0	0	0

[a]Included activity of trappers targeting otter and trappers not targeting otter combined.
[b]All otter removed from traps, including all incidental catches and releases.
[c]Included incidentally caught otter that were not returned to the trapper.
[d]95% confidence limits.

Table 5 (continued). Estimated number of trappers, trapping effort, otter captured (including all incidental catches and releases), otter released alive, and otter registered (including incidental catches) among otter trappers during the 2009 Michigan trapping season, summarized by county.[a]

	Trappers		Trapping effort (days)		Otter captured[b]		Otter released alive		Otter registered[c]	
County	Total	95% CL[d]	Total	95% CL[d]	Total	95% CL[d]	Total	95% CL[d]	Total	95% CL[d]
Montcalm	28	8	602	250	20	7	3	4	16	6
Montmorency	18	7	188	96	10	5	2	2	8	4
Muskegon	15	6	49	41	15	7	0	0	15	7
Newaygo	21	7	366	235	20	7	0	0	20	7
Oakland	0	0	0	0	0	0	0	0	0	0
Oceana	7	4	93	76	3	3	0	0	3	3
Ogemaw	16	6	159	105	13	6	2	2	11	5
Ontonagon	39	10	618	207	70	22	5	6	65	20
Osceola	25	8	414	297	18	7	0	0	18	7
Oscoda	15	6	103	46	11	6	2	2	10	6
Otsego	13	6	235	129	3	3	0	0	3	3
Ottawa	5	3	39	41	5	3	0	0	5	3
Presque Isle	18	7	219	192	13	6	2	2	11	5
Roscommon	29	8	348	150	20	8	2	2	18	7
Saginaw	10	5	114	61	8	5	2	2	7	4
St. Clair	0	0	0	0	0	0	0	0	0	0
St. Joseph	3	3	72	66	3	3	0	0	3	3
Sanilac	2	2	98	120	0	0	0	0	0	0
Schoolcraft	21	7	240	112	47	21	16	12	31	13
Shiawassee	0	0	0	0	0	0	0	0	0	0
Tuscola	3	3	25	30	2	2	0	0	2	2
Van Buren	2	2	18	22	2	2	0	0	2	2
Washtenaw	0	0	0	0	0	0	0	0	0	0
Wayne	0	0	0	0	0	0	0	0	0	0
Wexford	13	6	149	79	15	7	3	3	11	5
Unknown	10	5	101	70	18	10	0	0	18	10
Statewide[e]	919	38	15,521	1,264	1,127	81	105	39	1,022	65

[a]Included activity of trappers targeting otter and trappers not targeting otter combined.
[b]All otter removed from traps, including all incidental catches and releases.
[c]Included incidentally caught otter that were not returned to the trapper.
[d]95% confidence limits.
[e]Number of trappers does not add up to statewide total because trappers could trap in more than one county. Column totals for trapping effort and capture may not equal statewide totals because of rounding errors.

Table 6. Mean days required to harvest an otter among trappers that targeted otter, 1997-2009.

	Region							
	Upper Peninsula		Northern Lower Peninsula		Southern Lower Peninsula		Statewide	
Year	Mean	95% CL[a]	Mean	95% CL[a]	Mean	95% CL[a]	Mean	95% CL[a]
1997	17.2	13.3	33.0	19.1	16.7	21.6	22.5	10.2
1998	13.6	5.6	21.5	11.2	34.0	28.0	16.2	5.2
1999	12.9	2.7	25.8	7.4	23.3	20.2	17.2	3.1
2000	15.3	5.4	31.2	10.9	23.0	15.7	19.9	4.9
2001	13.5	3.5	25.5	6.7	32.7	26.1	19.2	3.8
2002	27.0	9.0	25.6	9.5	26.5	14.8	26.2	6.3
2003	21.8	3.4	42.5	9.3	28.8	8.5	26.3	3.2
2004	23.1	5.8	36.7	11.1	62.5	29.1	29.3	5.5
2005	19.6	5.3	38.5	14.1	35.1	21.1	26.9	6.1
Among trappers targeting otter[b]								
2006	21.5	1.7	37.9	4.5	43.6	7.2	27.7	1.8
2007	23.7	2.6	42.8	6.5	33.5	7.2	28.7	2.4
2008	19.3	2.2	33.4	5.4	35.5	8.6	25.6	2.4
2009	14.1	1.5	31.2	4.3	34.7	6.7	20.6	1.7
Among all trappers[b]								
2006	17.8	1.5	26.5	3.4	29.6	4.9	20.6	1.4
2007	20.7	2.3	31.7	5.0	24.8	5.1	22.8	1.9
2008	15.4	1.8	27.4	4.4	28.3	6.7	18.9	1.7
2009	11.0	1.2	20.7	2.9	23.6	4.6	15.2	1.3

[a]95% confidence limits.

[b]Beginning in 2006, two separate estimates were calculated: (1) an estimate excluding the activity of trappers that did not target otter and (2) an estimate of all trappers combined. The latter estimates are more comparable to estimates from previous years.

Table 7. Estimated number of beaver trappers, their trapping effort (days), number of beaver captured, and trapping success in Michigan during 2007-2009.[a]

Variable	Year						Change[c] (%)
	2007		2008		2009		
	Estimate	95% CL[b]	Estimate	95% CL[b]	Estimate	95% CL[b]	
Trappers (No.)	1,138	37	1,223	40	1,218	39	0
Trapping effort (Days)	28,736	1,817	30,578	1,897	31,455	2,031	3
Beavers captured (No.)	12,819	1,025	15,270	1,169	15,273	1,173	0
Trappers that captured a beaver (%)[d]	85	2	90	1	90	1	0
Trappers using snares in open water (No.)[e]	NA	NA	NA	NA	69	13	NA
Beaver caught with snares in open water (No.)[e]	NA	NA	NA	NA	128	51	NA
Trapped beaver in April (Trappers)	409	27	508	31	527	32	4
Beaver caught in April (No.)	3,986	548	5,361	652	5,253	618	-2

[a]Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. These estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.
[b]95% confidence limits.
[c]The change between 2008 and 2009 for proportion of trappers catching beaver is reported as the difference between years rather than the proportional change.
[d]Trapper success was incorrectly reported in previous harvest report for 2007 (Frawley 2008).
[e]Estimates not available prior to 2009.
[*]P<0.005.

Table 8. Estimated number of trappers, trapping effort, and beaver captured by otter harvest tag holders during the 2009 Michigan trapping season, summarized by area.[a]

	Trappers		Trapping effort (days)		Beaver captured[a]		Trapper success	
Area	Total	95% CL[b]	Total	95% CL[b]	Total	95% CL[b]	%	95% CL[b]
Upper Peninsula	576	33	12,596	1,320	7,987	952	92%	2%
Lower Peninsula	680	35	18,615	1,661	7,199	740	90%	2%
Zone 2	492	31	13,039	1,361	5,243	597	89%	2%
Zone 3	240	23	5,577	797	1,956	383	89%	3%
Unknown	15	6	244	149	87	59	NA	NA
Statewide	1,218	39	31,455	2,031	15,273	1,173	90%	1%

[a]Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. These estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.
[b]95% confidence limits.

Table 9. Estimated number of trappers, trapping effort, and beaver captured by otter harvest tag holders during the 2009 Michigan trapping season, summarized by county.[a]

	Trappers		Trapping effort (days)		Beaver captured	
County	Total	95% CL[b]	Total	95% CL[b]	Total	95% CL[b]
Alcona	34	9	558	190	234	88
Alger	33	9	935	416	551	236
Allegan	2	2	5	6	7	8
Alpena	25	8	801	319	239	126
Antrim	13	6	118	71	131	96
Arenac	7	4	157	119	57	45
Baraga	39	10	705	295	357	119
Barry	13	6	186	91	56	39
Bay	10	5	227	125	56	36
Benzie	10	5	83	52	69	56
Berrien	0	0	0	0	0	0
Branch	2	2	49	60	8	10
Calhoun	3	3	106	98	206	250
Cass	2	2	49	60	8	10
Charlevoix	5	3	38	33	11	11
Cheboygan	36	9	881	279	375	126
Chippewa	98	15	1,737	482	1,163	320
Clare	59	12	1,264	377	445	147
Clinton	3	3	83	73	5	6
Crawford	21	7	625	330	167	81
Delta	47	11	688	185	435	176
Dickinson	41	10	1,199	420	430	144
Eaton	0	0	0	0	0	0
Emmet	15	6	255	145	80	38
Genesee	8	4	101	70	87	89
Gladwin	31	9	890	343	293	133
Gogebic	34	9	476	159	451	181
Gd. Traverse	15	6	383	203	74	40
Gratiot	5	3	170	137	2	2

[a]Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. These estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.

[b]95% confidence limits.

Table 9 (continued). Estimated number of trappers, trapping effort, and beaver captured by otter harvest tag holders during the 2009 Michigan trapping season, summarized by county.[a]

	Trappers		Trapping effort (days)		Beaver captured	
County	Total	95% CL[b]	Total	95% CL[b]	Total	95% CL[b]
Hillsdale	0	0	0	0	0	0
Houghton	44	10	1,096	336	440	150
Huron	0	0	0	0	0	0
Ingham	2	2	0	0	0	0
Ionia	8	4	180	107	38	25
Iosco	15	6	201	99	88	49
Iron	56	12	989	247	564	182
Isabella	20	7	518	221	126	62
Jackson	3	3	41	48	2	2
Kalamazoo	3	3	119	105	11	14
Kalkaska	38	10	751	237	276	112
Kent	13	6	307	202	29	17
Keweenaw	11	5	190	97	65	49
Lake	16	6	224	114	57	28
Lapeer	10	5	113	62	39	30
Leelanau	2	2	16	20	15	18
Lenawee	0	0	0	0	0	0
Livingston	2	2	3	4	3	4
Luce	43	10	572	274	420	176
Mackinac	54	11	662	206	564	218
Macomb	2	2	39	48	8	10
Manistee	7	4	106	66	56	40
Marquette	72	13	1,387	337	896	286
Mason	11	5	487	294	134	98
Mecosta	34	9	602	274	301	126
Menominee	21	7	337	155	83	37
Midland	28	8	592	257	252	123
Missaukee	33	9	653	271	322	125
Monroe	0	0	0	0	0	0

[a]Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. These estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.
[b]95% confidence limits.

Table 9 (continued). Estimated number of trappers, trapping effort, and beaver captured by otter harvest tag holders during the 2009 Michigan trapping season, summarized by county.[a]

	Trappers		Trapping effort (days)		Beaver captured	
County	Total	95% CL[b]	Total	95% CL[b]	Total	95% CL[b]
Montcalm	29	8	612	246	118	53
Montmorency	29	8	474	186	245	107
Muskegon	21	7	214	82	118	53
Newaygo	29	8	510	194	136	53
Oakland	8	4	96	64	65	51
Oceana	13	6	101	55	59	30
Ogemaw	25	8	581	205	204	97
Ontonagon	44	10	904	279	962	342
Osceola	41	10	883	337	453	180
Oscoda	21	7	314	138	160	80
Otsego	21	7	538	213	213	92
Ottawa	5	3	78	67	5	6
Presque Isle	26	8	523	264	250	119
Roscommon	38	10	855	317	392	159
Saginaw	15	6	168	86	59	28
St. Clair	5	3	23	22	5	3
St. Joseph	5	3	164	116	87	62
Sanilac	3	3	121	123	13	13
Schoolcraft	39	10	718	292	605	261
Shiawassee	2	2	8	10	2	2
Tuscola	8	4	75	48	92	79
Van Buren	2	2	13	16	15	18
Washtenaw	0	0	0	0	0	0
Wayne	0	0	0	0	0	0
Wexford	18	7	278	122	144	89
Unknown	15	6	244	149	87	59
Statewide[c]	1,218	39	31,455	2,031	15,273	1,173

[a]Furtakers trapping beaver were not required to obtain an otter harvest tag; thus, estimates associated with beaver trapping do not include all furtaker participation, effort, or harvest. These estimates only represent the participation, effort, or harvest of trappers that obtained an otter harvest tag.

[b]95% confidence limits.

[c]Number of trappers does not add up to statewide total because trappers could trap in more than one county. Column totals for trapping effort and capture may not equal statewide totals because of rounding errors.

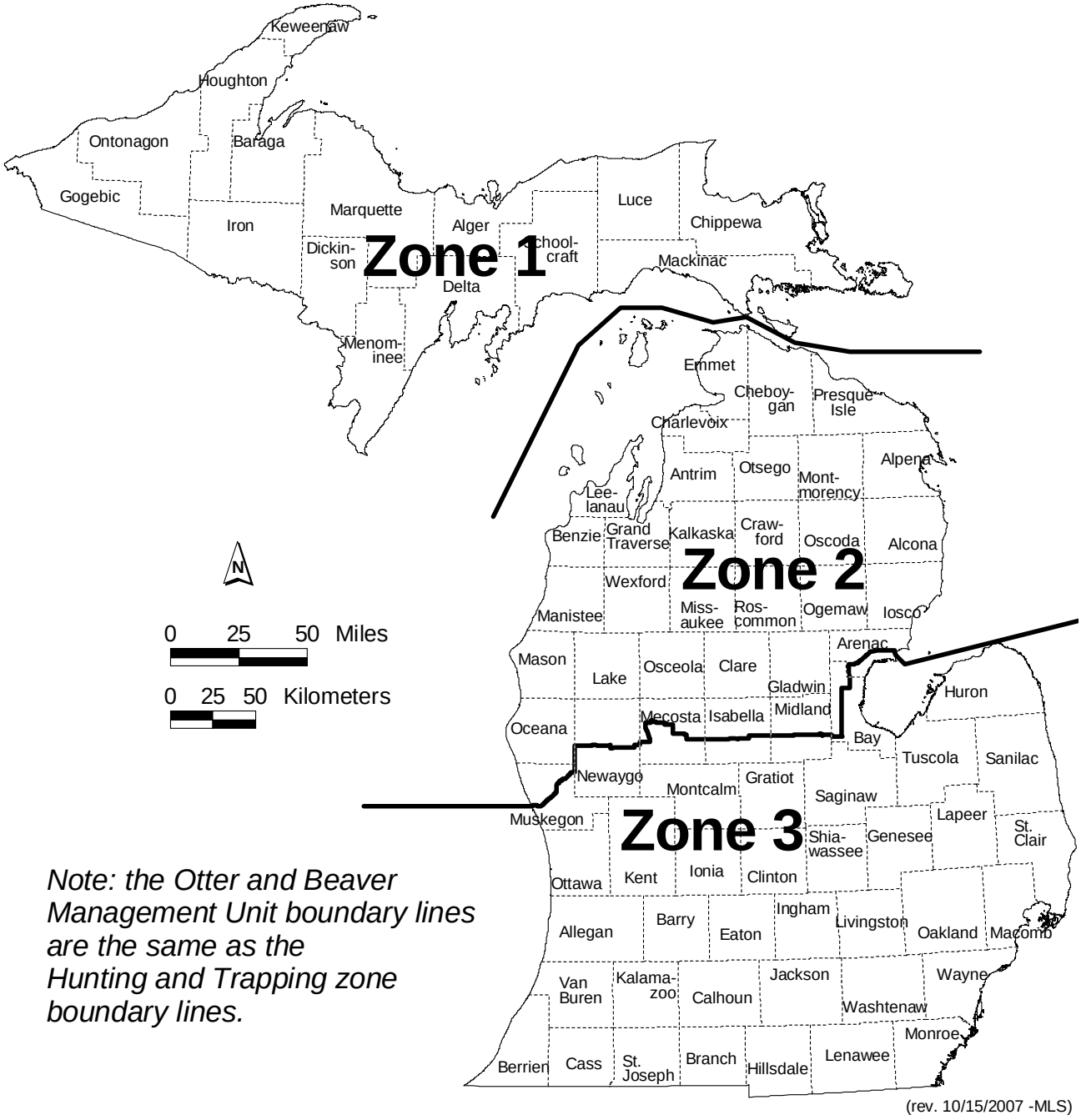

Figure 1. Otter and beaver management zones in Michigan, 2009.

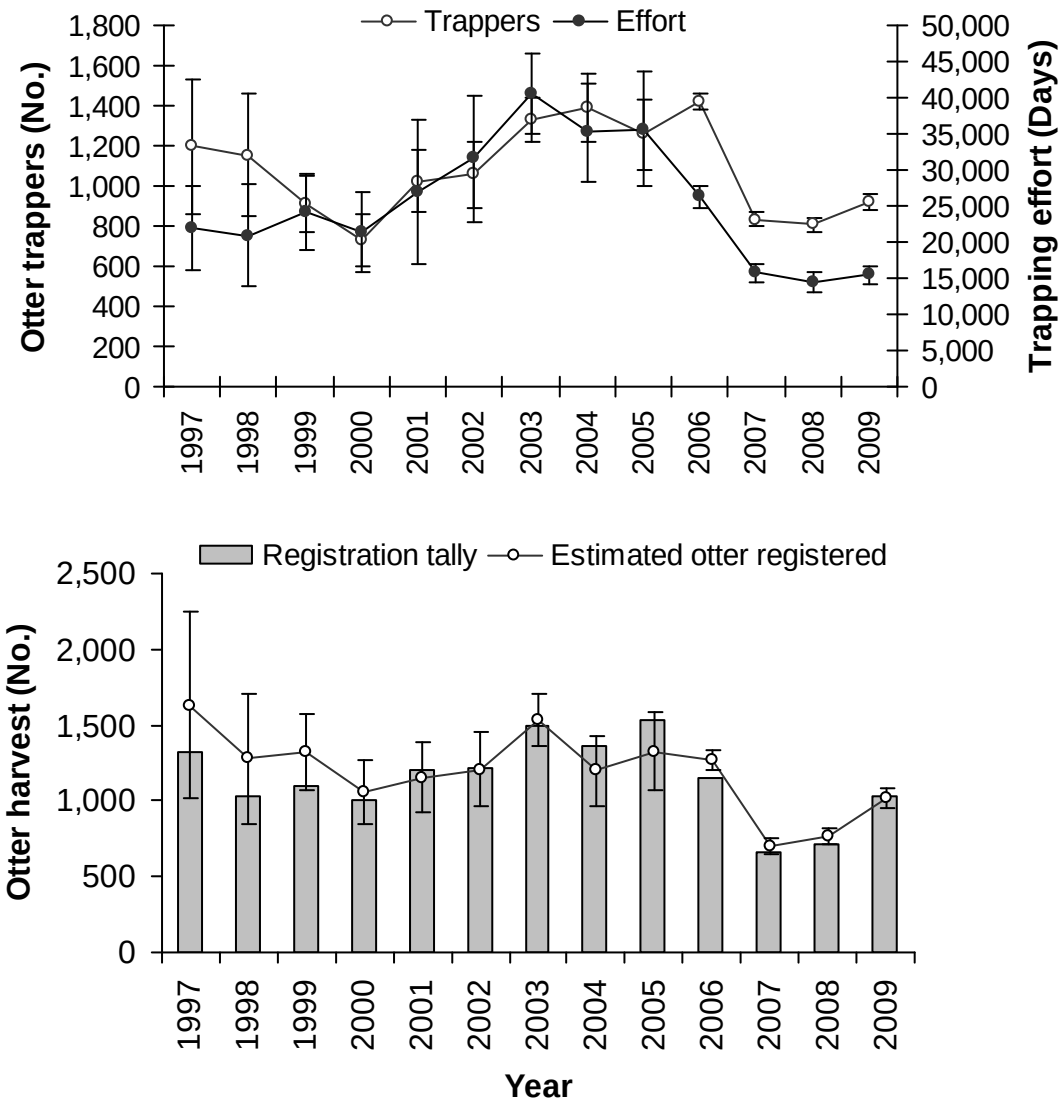

Figure 2. Estimated number of trappers, trapping effort (days), and number of otter captured and registered in Michigan, 1997-2009. Estimates of trapper numbers, trapping effort, and harvest were derived from harvest survey, while registration total was a tally of animals registered by trappers at registration stations (registration total included incidental catches not returned to trappers but excluded non-trapping mortality). Vertical bars represent the 95% confidence interval.

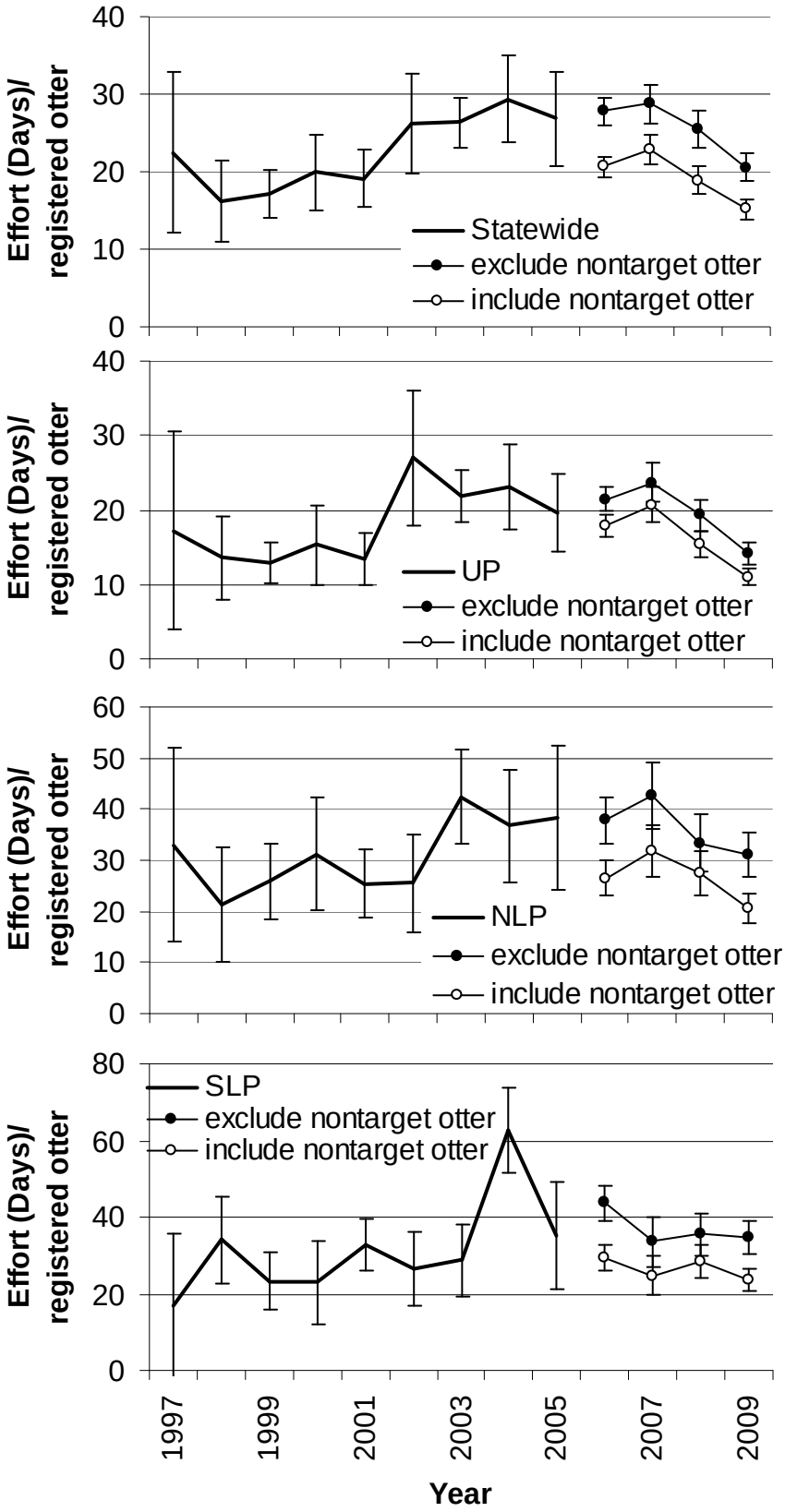

Figure 3. Estimated mean number of days required to harvest an otter in Michigan during 1997-2009, summarized by management zone. Beginning in 2006, two separate estimates were calculated: (1) an estimate excluding the activity of trappers that did not target otter and (2) an estimate of all trappers combined. The latter estimates are more comparable to estimates from previous years.

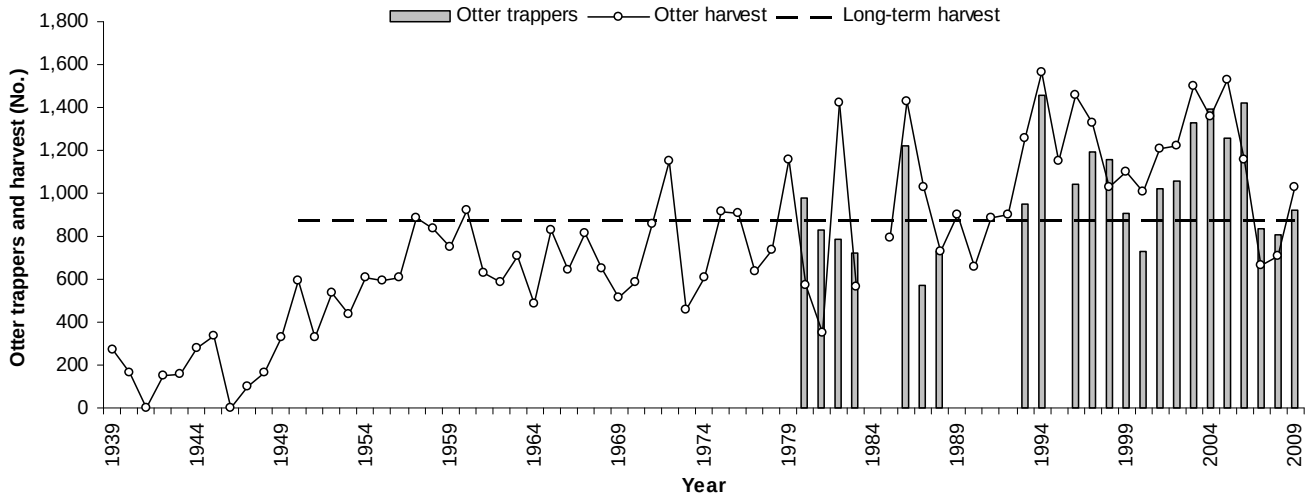

Figure 4. Otter harvest (sealing or registration tally, unpublished data) and estimated number of otter trappers (estimates from harvest survey) in Michigan, 1939-2009. Long-term (1950-2009) average harvest was 870 otter. Estimates were not available for years when values were not plotted.

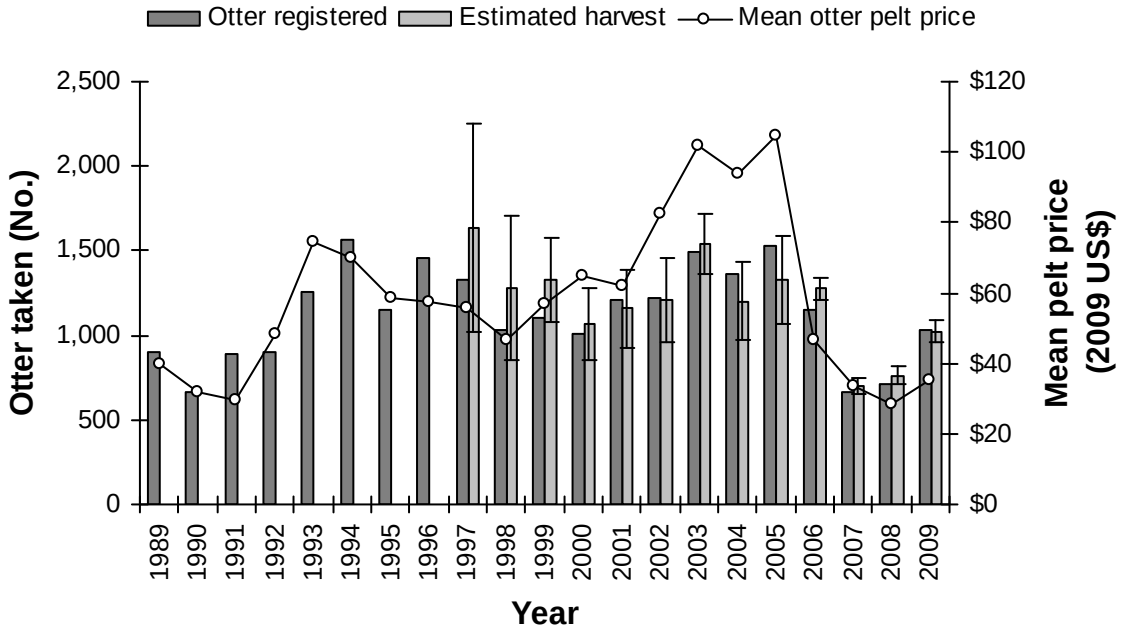

Figure 5. Otter registration totals, estimated otter harvest, and mean otter pelt prices in Michigan during 1989-2009. Mean pelt prices were the average paid in Minnesota and Wisconsin (Dexter 2010, Dhuey 2010). Pelt prices were reported in 2009 dollars by adjusting for inflation using the Consumer Price Index (Bureau of Labor Statistics 2009). Vertical bars represent the 95% confidence interval. Estimates were not available for years when values were not plotted.

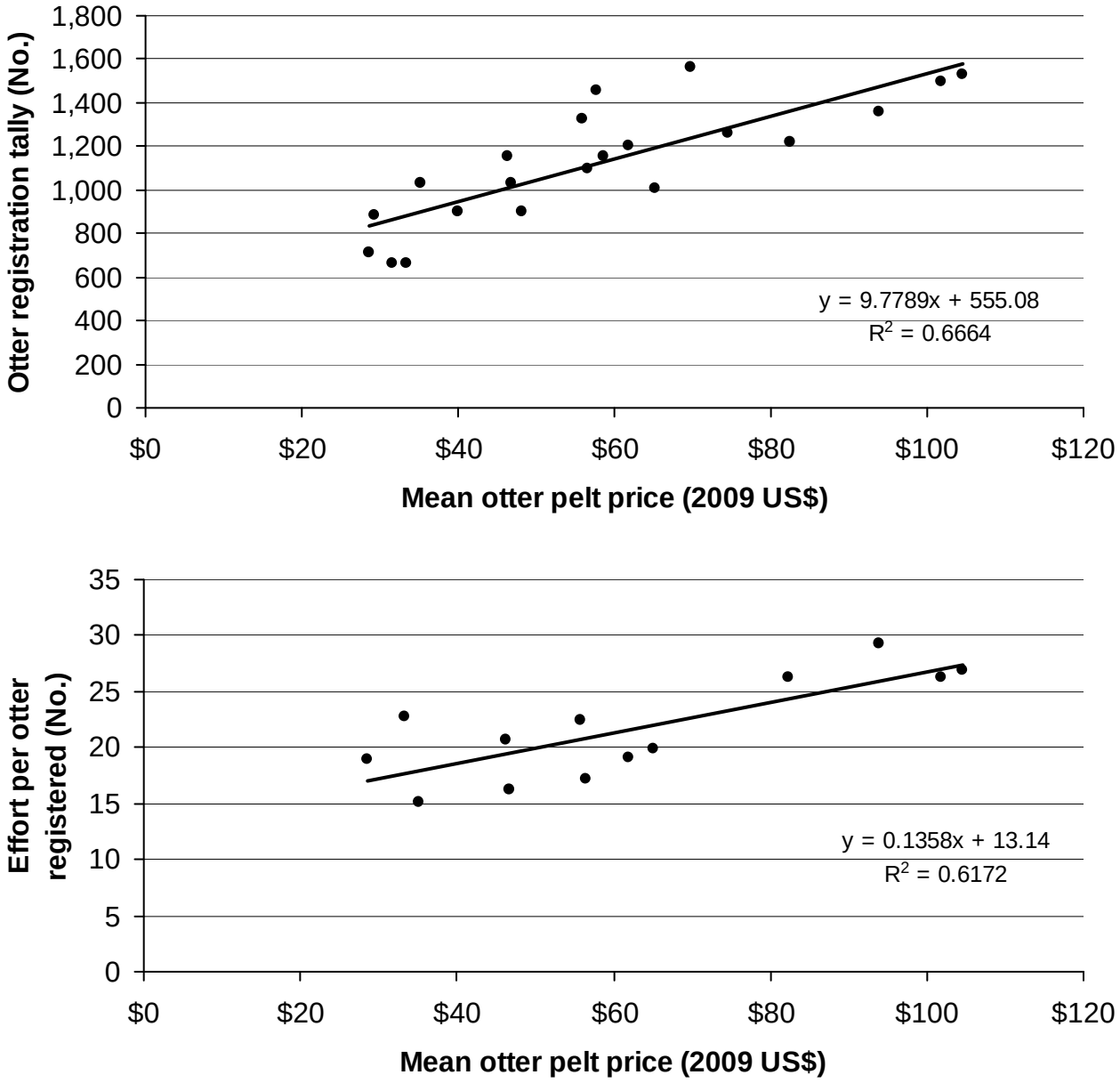

Figure 6. The relationship between the number of otter registered and mean otter pelt prices in Michigan during 1989-2009 (top), and the relationship between trapping effort per otter registered and mean otter pelt prices in Michigan during 1997-2009 (bottom).

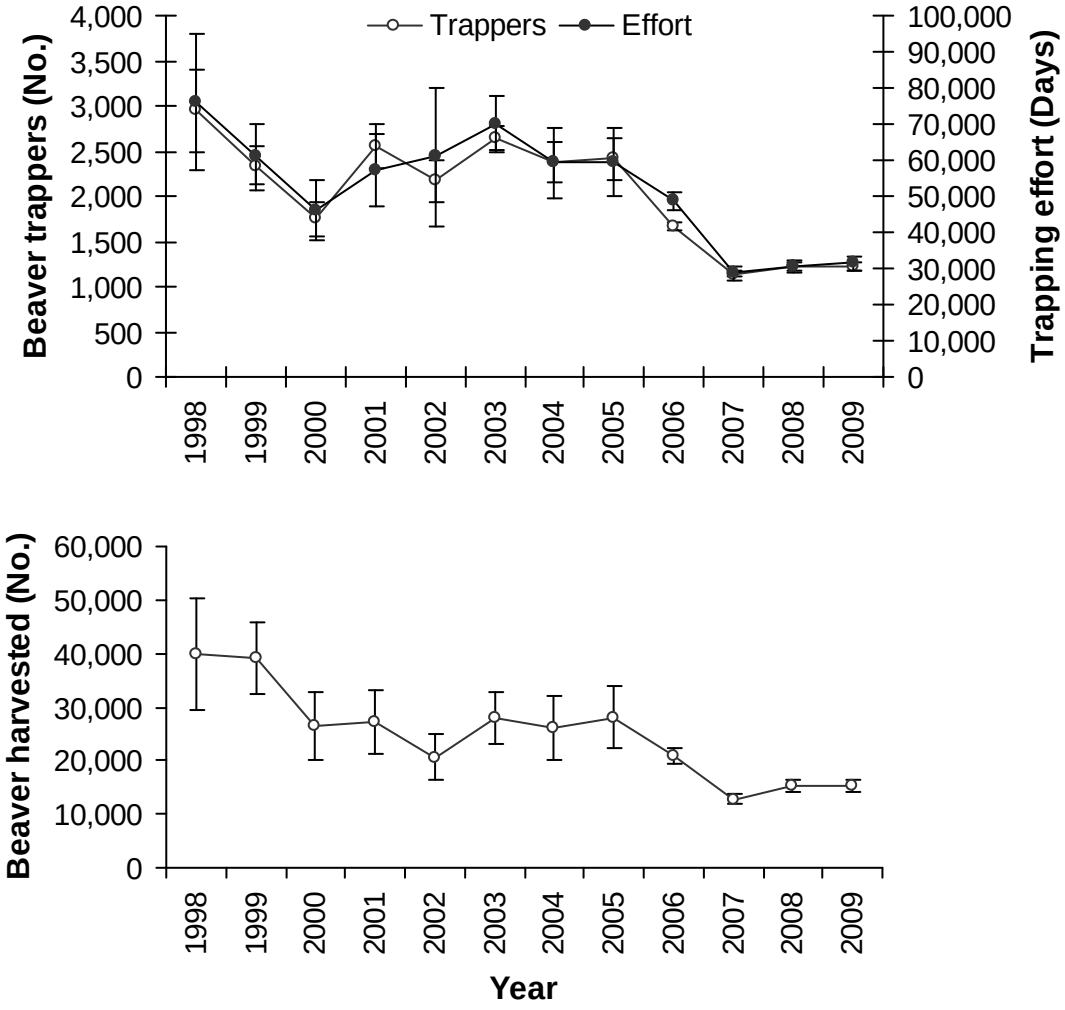

Figure 7. Estimated number of trappers, trapping effort (days), and number of beaver captured in Michigan, 1998-2009. Vertical bars represent the 95% confidence interval. The 2006-2009 estimates were not directly comparable to estimates from previous years because the 2006-2009 estimates only represent the participation, effort, and harvest of trappers that obtained an otter harvest tag. Also beginning in 2003, trappers taking beaver as part of a nuisance control business were asked to exclude nuisance animals from their reported harvest on annual harvest surveys.

Appendix A. Questionnaire used to collect data for 2009 otter and beaver harvest survey in Michigan.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT, WILDLIFE DIVISION

2009-10 OTTER AND BEAVER HARVEST REPORT

PO BOX 30030 LANSING MI 48909-7530

This information is requested under authority of Part 435, 1994 PA 451, M.C.L. 324.43539.

It is important that you complete and return this questionnaire even if you did not trap or capture any otter or beaver.

1. Did you place traps specifically for <u>otter</u> during the 2009-10 season?

[1] ☐ Yes [2] ☐ No, *Skip to question number 5.*

2. If you trapped during the 2009-10 <u>otter</u> season, please complete the following table.
(*Do not report trapping done as part of a nuisance control business.)*

COUNTY TRAPPED (List each county that you trapped for otter.)	**NUMBER OF DAYS TRAPPED FOR OTTER**	**NUMBER OF OTTER CAUGHT AND RELEASED** (Count only otters you released alive from your traps.)	**NUMBER OF OTTER CAUGHT AND REGISTERED** (Count all otter that were registered including incidental catches that were not returned to you.)

3. How many of the following traps did you set for <u>otter</u> in 2009-10?
(For each type, record the average number used per day.)

_____ Foothold
_____ Conibear

4. What is the status of <u>otter</u> in the county you trapped most often in 2009-10?

[1] ☐ Increasing [2] ☐ Decreasing [3] ☐ Stable [4] ☐ Not present

5. Did you incidentally catch any otter while trapping for other species that you have not already reported in Question #2.

[1] ☐ Yes [2] ☐ No, *Skip to question number 7.*

6. If you answered yes in the previous question, please report the location and number of incidental otters you captured. Please do not report otter already reported in question #2.

COUNTY WHERE INCIDENTAL OTTER CAUGHT (List each county that you caught an incidental otter.)	**NUMBER OF INCIDENTAL OTTER CAUGHT AND RELEASED** (Count only incidental otters you released alive from your traps.)	**NUMBER OF INCIDENTAL OTTER CAUGHT AND REGISTERED** (Count incidental otter that were registered including catches that were not returned to you.)

Questions continued on reverse side.

7. Did you place traps for <u>beaver</u> during the 2009-10 season?

[1] ☐ Yes [2] ☐ No, *skip to question 14.*

8. If you trapped during the 2009-10 <u>beaver</u> season, please complete the following table.
(*Do not report trapping done as part of a nuisance control business.)*

COUNTY TRAPPED (List each county that you trapped for beaver.)	**NUMBER OF DAYS TRAPPED FOR BEAVER**	**NUMBER OF BEAVER CAUGHT**

9. How many of the following traps did you set for <u>beaver</u> in 2009-10?
(For each type, record the average number used per day.)

_____ Foothold
_____ Conibear
_____ Snares

10. Did you attempt to trap beavers with snares in open water during the 2009-10 seasons?

[1] ☐ Yes [2] ☐ No (*Skip to Question 11*)

10a. If you attempted to trap beavers with snares in open water, how many beavers did you harvest with these sets during the 2009-10 seasons? _____ **BEAVER TAKEN**

11. Did you attempt to trap beavers during April 2010?

[1] ☐ Yes [2] ☐ No (*Skip to Question 12*)

11a. If you attempted to trap beavers during April 2010, how many beavers did you harvest in April? _____ **BEAVER TAKEN**

12. What is the status of <u>beaver</u> in the county you trapped most often in 2009-10?

[1] ☐ Increasing [2] ☐ Decreasing [3] ☐ Stable [4] ☐ Not present

13. Did you catch any <u>otter</u> in traps that were set for beaver in 2009-10?

[1] ☐ Yes [2] ☐ No (*Skip to Question 14*)

13a. If you answered yes, report number of <u>otter</u> caught in your beaver sets.

_____ otter caught in beaver sets

14. Do you have any comments or suggestions about otter or beaver management in Michigan?

_____
_____
_____
_____

Please return questionnaire in the enclosed postage-paid envelope.
Thank you for your help!